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SMM UV OBSERVATIONS OF ACTIVE REGION 5395

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ABSTRACT

The Ultraviolet Spectrometer and Polarimeter (UVSP) on the *Solar Maximum Mission* (SMM) spacecraft has been used extensively to study the spatial morphology and time variability of solar active regions in the far UV (at $\sim \lambda 1370 \text{ \AA}$) since July 1985. The normal spatial resolution of UVSP observations in this 2nd-order mode is $10''$, and the highest temporal resolution is 64 milliseconds. To make a full-field, $4' \times 4'$ image this wavelength using $5''$ raster steps takes about 3 minutes. UVSP can also make observations of the Sun at $\sim \lambda 2790$ with $3''$ spatial resolution when operated in its 1st-order mode; a full-field image at this wavelength (a so-called SNEW image) takes about 8 minutes.

UVSP made thousands of observations (mostly in 2nd-order) of AR 5395 during its transit across the visible solar hemisphere (from 7 to 19 March, inclusive). During this period, UVSP's duty cycle for observing AR 5395 was roughly 40%, with the remaining 60% of the time being fairly evenly divided between aeronomy studies of the Earth's atmosphere and dead time due to Earth occultation of the Sun. UVSP observed many of the flares tagged to AR 5395, including 26 GOES M-level flares and 3 X-level flares, one of which produced so much UV emission that the safety software of UVSP turned off the detector to avoid damage due to saturation. (See Table 1 for list of the UVSP experiments corresponding to these strong X-ray flares.) We present images and light curves of some of the more spectacular of the AR 5395 events (See Table 2 and Figures).

All of the UVSP AR 5395 data are available from the authors upon request.

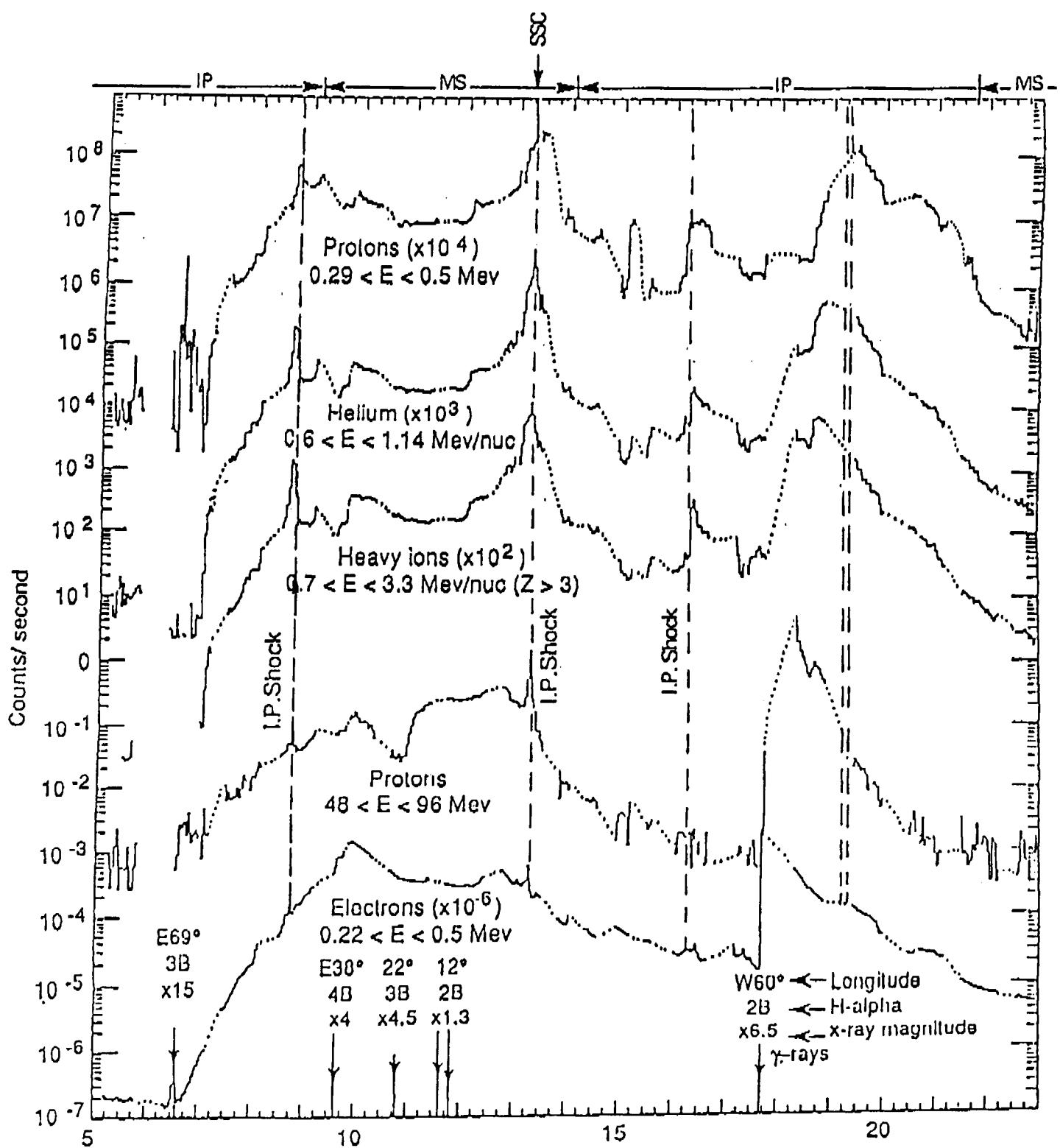


Table 1
M and X-class GOES flares from AR 5395 observed by UVSP

Date	GOES level	GOES t_{max} (UT)	UVSP Max. Counts $(0.056 \text{ s})^{-1}$	UVSP t_{max} (UT)
07 March	M2.0	06:00	6762	05:58
	M4.1	13:26	10855	<13:25
	M2.4	13:44	3620	<13:42
	X1.8	14:58	43775	<14:58
	M3.8	16:56	10961	17:00
	M4.2	22:38	12745	<22:45
08 March	M2.1	08:33	2271	08:30
	M4.6	18:57	6681	<18:57
09 March	M1.8	02:46	11276	<02:44
	M1.3	23:20	4177	23:19
10 March	X4.5	19:22	>59310*	>19:12
11 March	M1.6	01:56	4538	<01:46
	M2.0	03:34	13056	03:42
	M1.2	06:50	2700	<06:45
	M1.2	18:36	4129	18:35
	M1.1	23:18	4396	<23:11
12 March	M2.5	15:10	4587	15:11
	M1.8	16:24	10276	16:22
	M6.3	21:03	4964	21:01
13 March	M1.4	01:37	2686	<01:38
	X1.2	03:26	5935	<03:25
14 March	M2.0	03:05	2094	03:01
15 March	M4.8	06:52	13673	06:47
	M4.2	08:39	2541	08:27
16 March	M1.4	19:01	7510	18:54
17 March	M2.5	02:47	14359	02:45
18 March	M3.3	20:35	893	20:31
	M3.1	22:05	1380	21:57
19 March	M1.3	07:49	1118	07:38

* Detectors shut down when count rate exceeded 10^6 s^{-1}

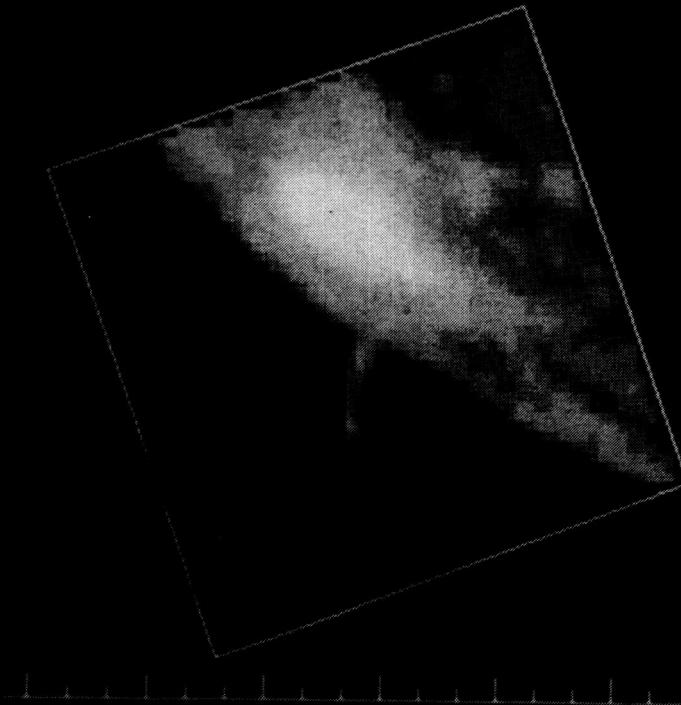
Table 2

Highlights of UVSP-SMM Observations of AR 5395
6 - 20 March 1989

Date	Time (UT)	Expt. No.	Type	Max.*	Comments
6 March	0921 - 1002	85125	SNEW	1st order	Spot group
7 March	1325 - 1338	85209	BPFIND	10855	M4.1 at 1326
7 March	1455 - 1458	85216	raster	43775	X1.8 at 1458
8 March	1853 - 1857	85302	raster	24057	M4.0 at 1857
10 March	1907 - 1910 1911 - 1913	85489 85491	raster TINYRAST	35413 59310	X4.5 at 1922
11 March	0915 - 0951	85557	SNEW	1st order	1st order flare
19 March	0733 - 0747	86230	BPFINDWL	1118	Post-flare loops

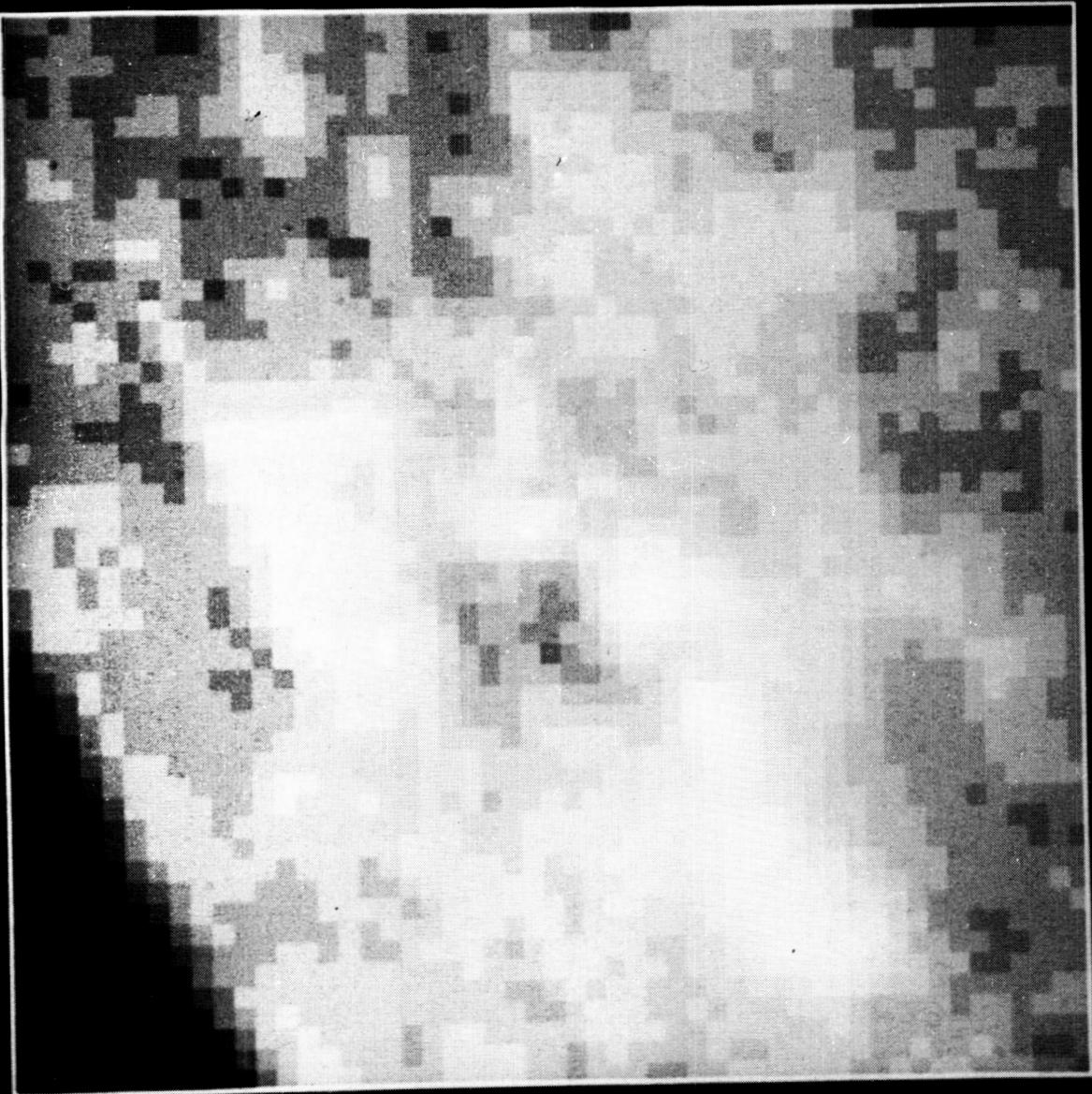
* Counts per 0.056 s

Expt. 85216 (+0) SII 1
1989 Mar. 7 (DOY 66) 14:54:52 UT
Detector 1

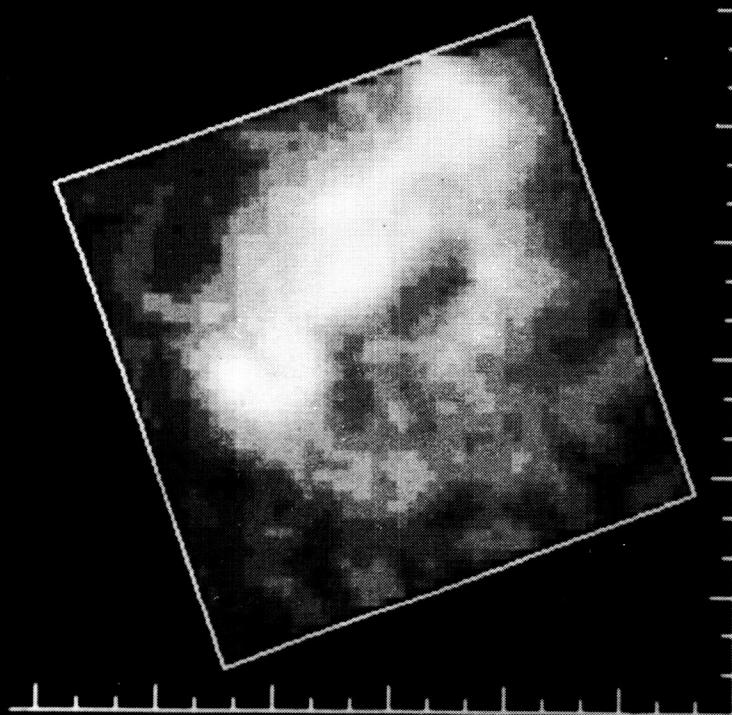


Max., avg. counts = 43775, 109
AR 5395 on NE limb: X1.8
Each division = 20 arc sec
1 4 16 64 256 1024 4096 16384

UVSP Expt. 85302 1853-1856 UT 8 Mar 1989

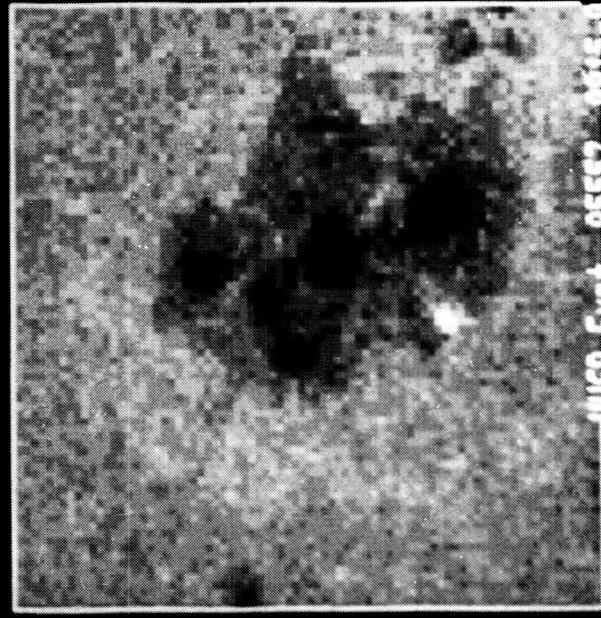
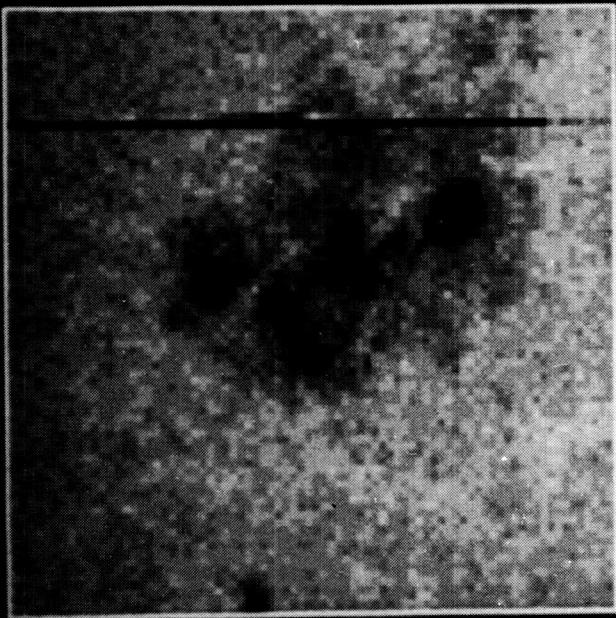
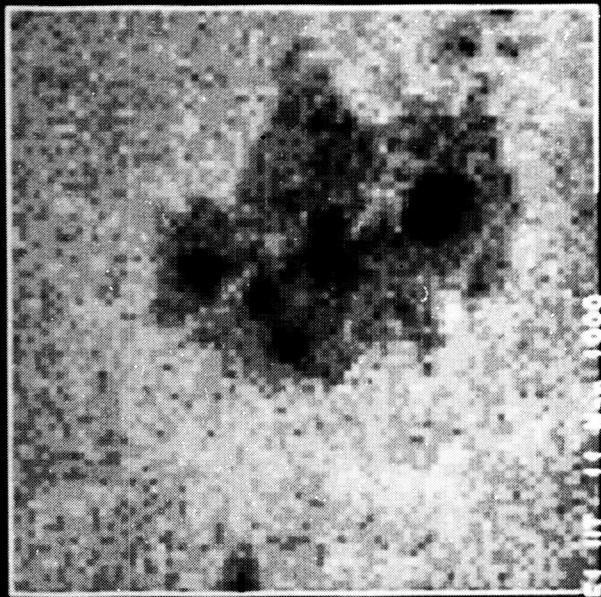
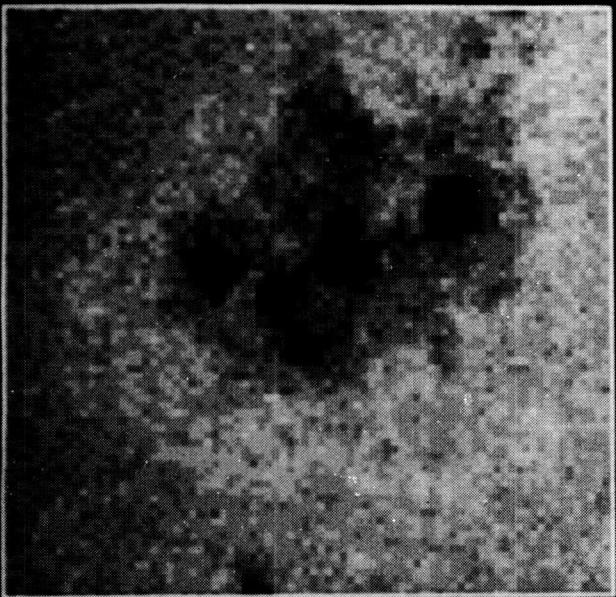


Expt. 85489 (+0)
1989 Mar. 10 (DOY 69) Slit 1
Detector 1 19:07:39 UT



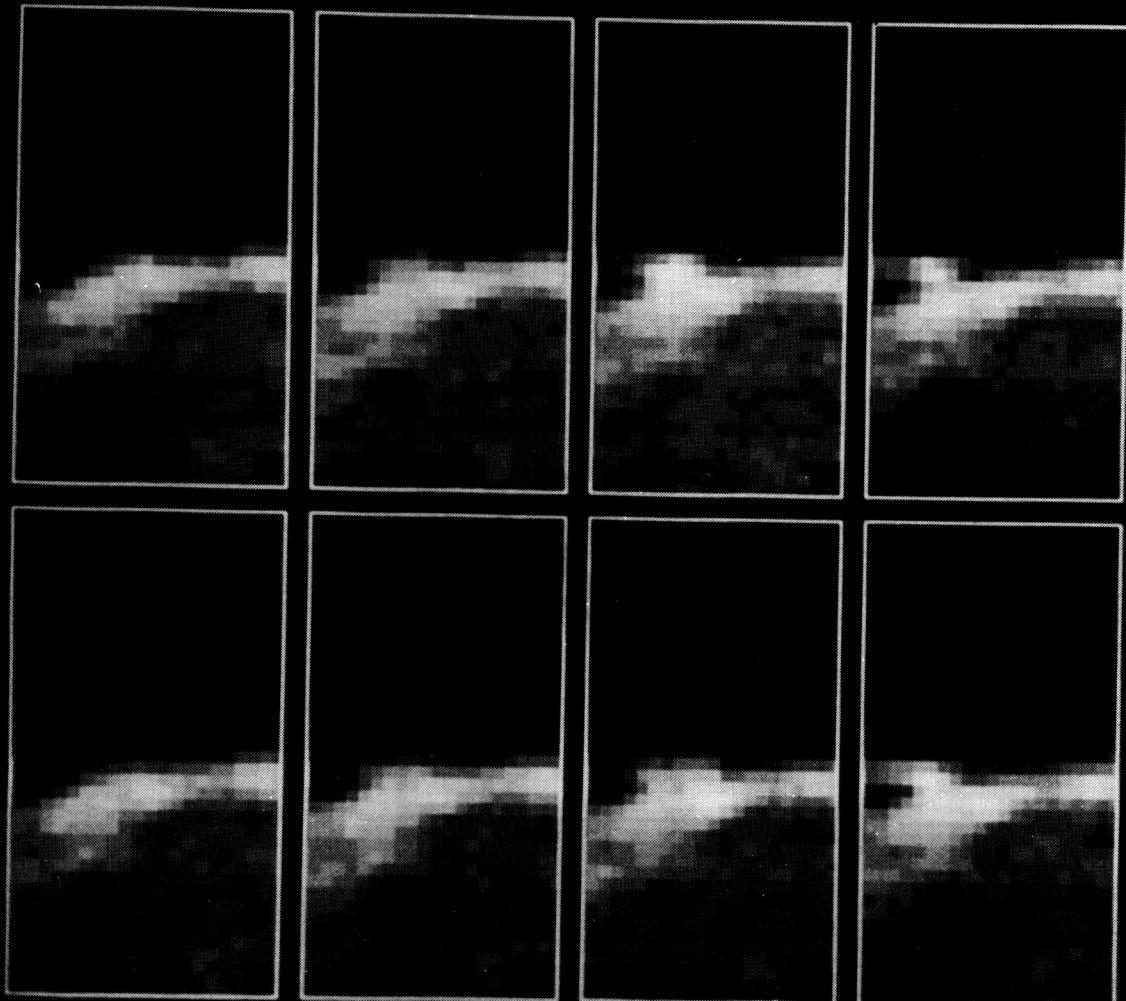
Max., avg. counts = 35413, 263
X4.5 Flare from Active Region: 5395
Each division = 20 arc sec

1 4 16 64 256 1024 4096 16384



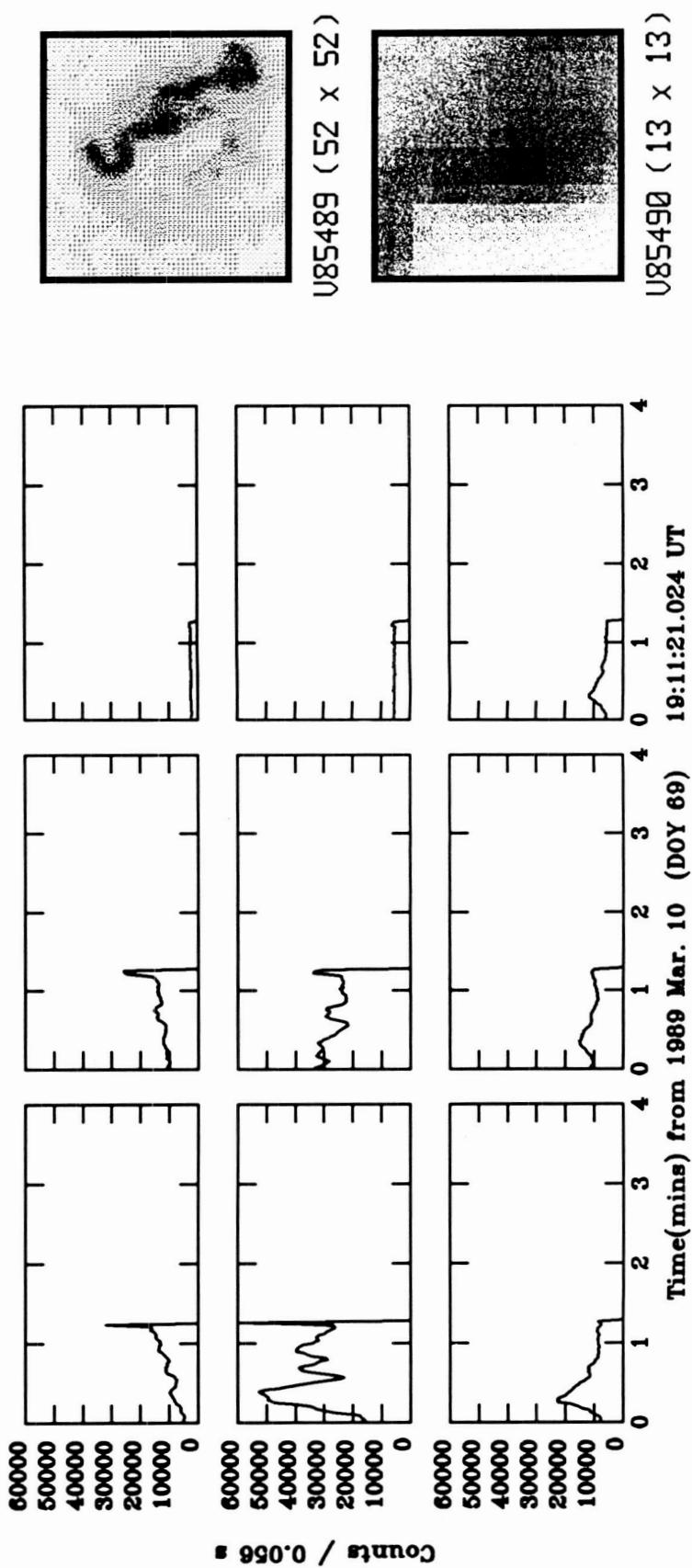
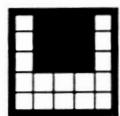
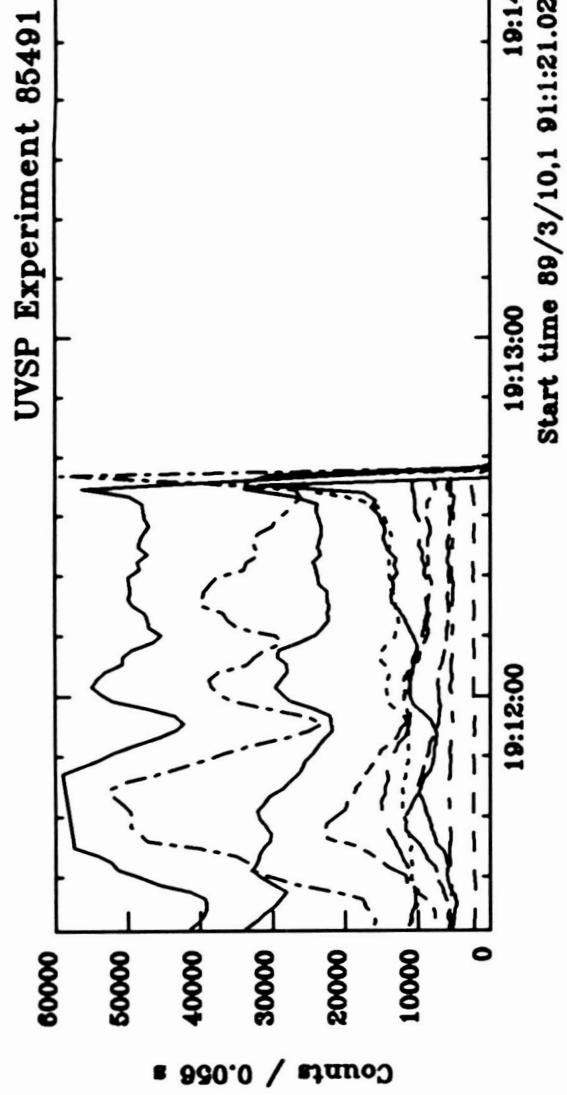
WPS Expt. 8557 6/15/69 Ut. II Her. 1969

UVSP Expt. 86230 0733-0747 UT 19 Mar 1989



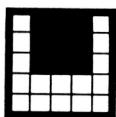
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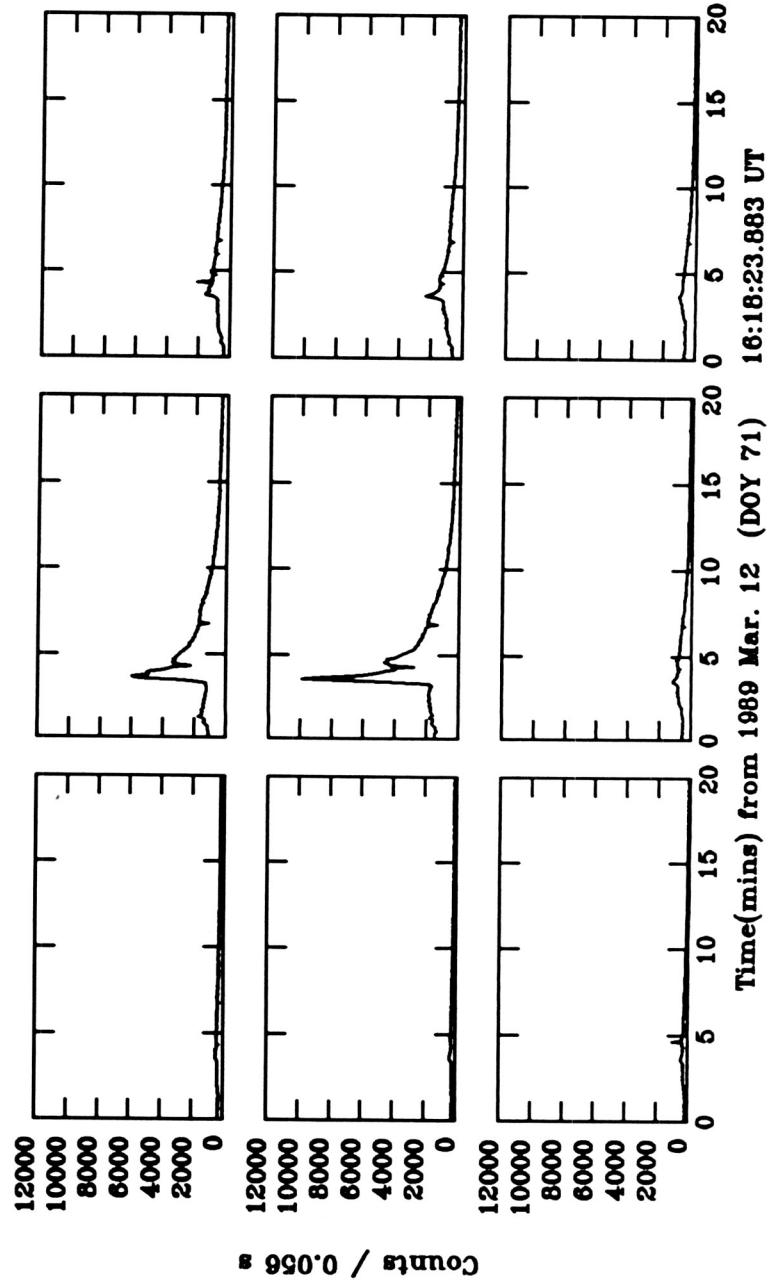
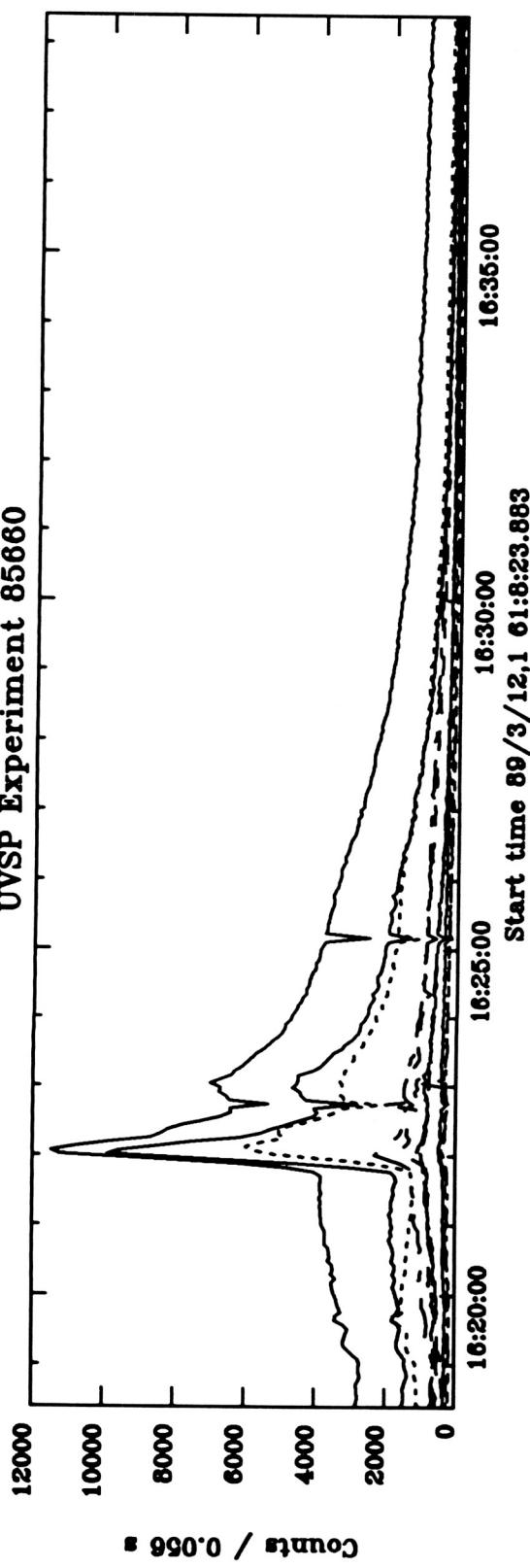


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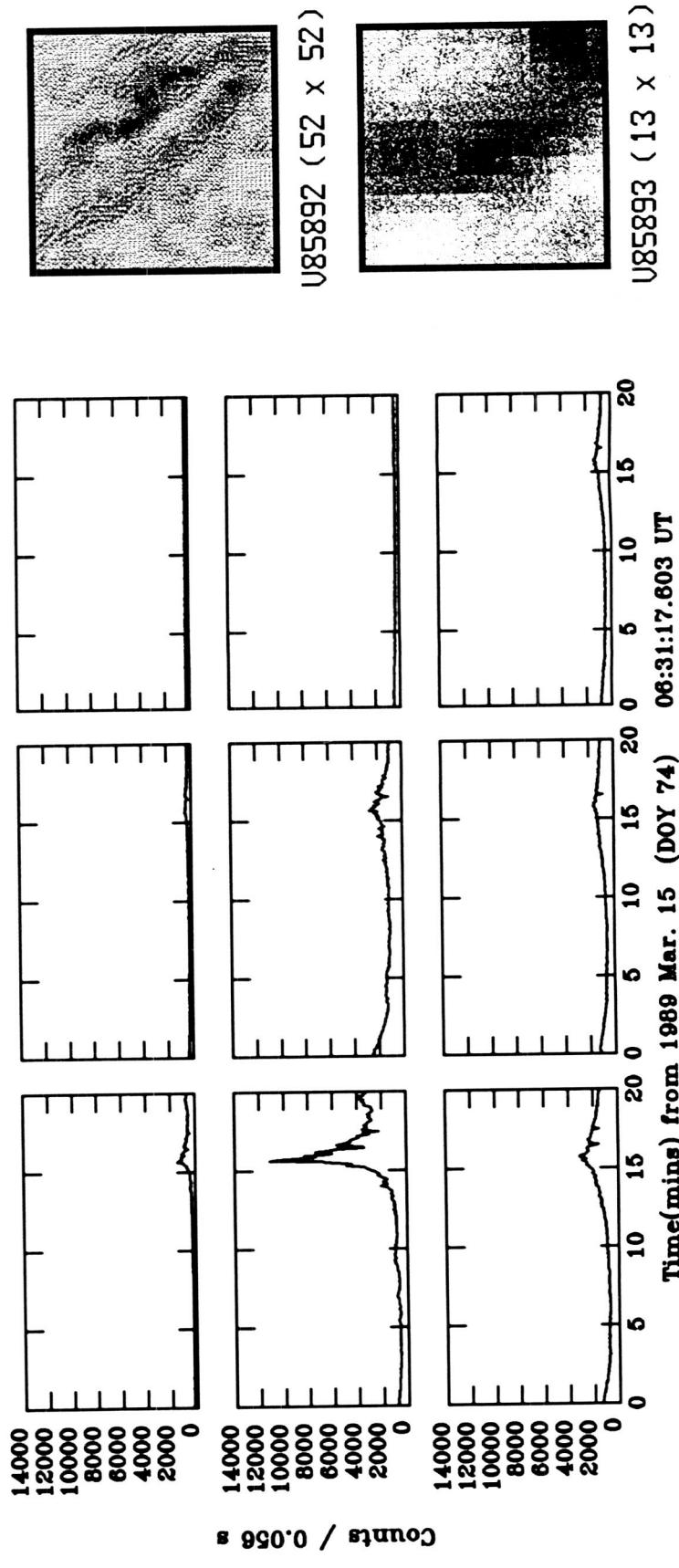
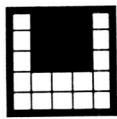
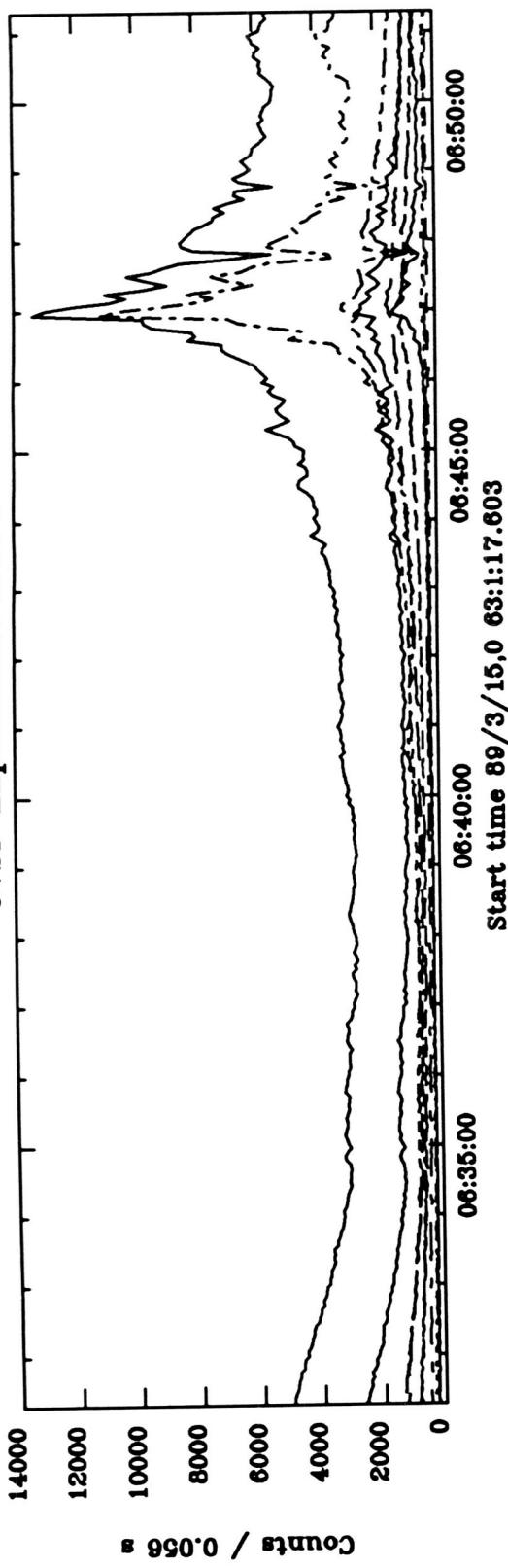
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UVSP Experiment 85660



UVSP Experiment 85894



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